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ABSTRACT

Intensive scheduling has been shown to be an effective educational medium. The Institute for Personal and Career Development at Central Michigan University has developed an external degree program for adults that uses various innovative approaches including intensive scheduling. Several scheduling patterns are offered. A number of studies have directly and indirectly investigated various aspects of intensive scheduling. The results of these studies are presented and include those concerning short-term cognitive changes, retention of material learned, student and faculty attitudes, problems with intensive scheduling, and predictions that can be made on the basis of the data presented. Suggestions of areas for further study are given. (JMF)

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FACILITATING NON-TRADITIONAL LEARNING:

AN UPDATE ON RESEARCH AND EVALUATION IN INTENSIVE SCHEDULING

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PART I: INTRODUCTION AND BACKGROUND

Introduction

This paper focuses on the background of and the need for intensive scheduling in institutions of higher education and reports the results of efforts by various educational institutions to deliver programs by utilizing an intensive scheduling format.

The term "intensive scheduling" as used in this paper refers to an innovative approach to scheduling courses in which students study one subject for a concentrated period of time and in which formal classroom contact time between the students and the instructor is limited to a time-compressed format.

A Brief Historical Background of Intensive Scheduling

Although the utilization of intensive scheduling is referred to as an innovation, experiments in intensive study were undertaken over a century ago. In 1968, Scio College in Ohio established a plan whereby students pursued one subject at a time, going on to the next subject when the faculty determined they were ready. Although reporting encouraging results the college dropped the one-study system in 1877.

About the same time Williamston Female College in South Carolina adopted a schedule whereby faculty and students would concentrate on the same subject at the same time for a period of twenty-seven days. There were seven such time blocks throughout the school year. The plan was followed for more than thirty

years and was credited with increasing the attention of students and their retention of material.

One of the first colleges in America to innovate with the time factor during the present century was Hiram College of Ohio. In 1931, Hiram experimented with intensive study during the summer. After evaluating the results, Hiram adopted a plan in which the school's curricula were divided into five terms of seven weeks each. For the seven week period the students and faculty concentrated on one intensive course. The Hiram Study Plan continued until 1958. It was discontinued although a large percentage of students favored the plan. The faculty had changed since the initiation of the plan, and the newer faculty members were less enthusiastic toward it (28).

Intensive scheduling has been less extensively studied during the history of higher learning than have other elements of higher education. This is perhaps because colleges and universities have deeply entrenched patterns governing the timing of their activities. Most decisions made about scheduling are determined by tradition or necessity. However, most recently some leadership has emerged regarding innovation that includes the area of intensive scheduling. The Carnegie Commission on Higher Education issued many publications during its lifespan of 1968 to 1973, some of which dealt explicitly with time shortening options (see e.g., 6). Commission encouragement has been instrumental in stimulating innovation in scheduling in American institutions of higher education.

Published reports of other groups studying higher education, such as the Newman Task Force (6) and the Commission on Non-Traditional Education (27), have called for a reexamination of various educational practices and for experimentation which could include intensive scheduling. These reports are supportive of efforts to experiment with various scheduling patterns.

The Present Need for Intensive Scheduling

Today, higher education is beginning a new era. This new era will be characterized by an increased emphasis on the concept of life-long learning as a major goal of higher education. The belief that education is a life-long process is based upon the recognition that knowledge is so vast that it is impossible to cover everything in sixteen or twenty years of formal study before going to work and that the rate of change makes much of what has been learned obsolete. The concept of continued learning in order to keep abreast of a particular field of study is being supplemented by the need to develop new fields and to prepare for new vocations.

With the increased emphasis on life-long learning, increased numbers of students who are older than the students who have traditionally been served by conventional colleges will be seeking opportunities to participate in higher education. In order to serve this new clientele, new patterns of delivery will emerge. These new patterns of delivery will include new patterns of course scheduling. Adults lead complex and varied lives. Developing the timing for an educational activity which will best fit the life patterns of participants will be imperative to the success of that activity.

Central Michigan University and Intensive Scheduling

The Institute for Personal and Career Development (Institute) at Central Michigan University, Mt. Pleasant, Michigan, was designed to develop and deliver an external degree program for adults. Since its establishment in 1971, the Institute has served over 12,000 adult students and has nearly 4,000 graduates.

The Institute has developed programs in cooperation with major corporations, governmental agencies, national associations, and military installations. It utilizes various innovative approaches to serve this adult clientele including:

the assessment of experiential learning for credit, program individualization, education brokering, modular packaging of learning materials, and intensive scheduling. It is this last approach that is the focus of this paper.

Intensive scheduling of courses is a key component in the efforts of the Institute to meet the unique needs of the educationally disenfranchised working adults who make up the majority of its students. Intensive courses offered by the Institute are complete graduate courses consisting of at least 36 instructor-student contact clock hours, but which are offered in time frames which are dramatically more compressed than the usual semester or quarter. Currently, the Institute offers complete courses according to the following scheduling patterns: (1) courses offered on four alternating weekends with three clock hours offered on Friday evening and six clock hours on Saturday, (2) courses offered on three alternating weekends with four hours on Friday evening and eight hours on Saturday, (3) courses offered each week for nine weeks with four hours one night per week, (4) courses offered eight hours per day for five days, (5) courses offered on two weekends, with at least one intervening weekend, with four hours on Friday night, eight hours on Saturday and six hours on Sunday. Classroom instruction consists of at least twelve clock hours in instruction for each semester hour of credit. Students register three to five weeks in advance of the starting date of class. Textbooks, course materials, and pre-class assignments are given to the students at that time so that they may be well prepared for class instruction.

PART II: EMPIRICAL FINDINGS

The second part of this paper presents the results of a number of studies which have directly or indirectly investigated various aspects of intensive scheduling, including the results of studies conducted at Central Michigan

University.

Short-Term Cognitive Changes

There is substantial quantitative and qualitative data which suggest that intensive courses are effective in producing short-term cognitive changes.

Studies reporting the results of intensive programs in pediatric nursing (7) and in modern foreign languages (8, 29) have reported "significant," "substantial," and "measurable" gains in knowledge and understanding of the course material. Unfortunately these studies did not use a control group; so no direct comparison could be made to the performance of students with similar abilities in similar courses using different scheduling patterns.

Powell (28) has summarized the results of six studies at the secondary and post secondary levels. These studies compared students in intensive courses with "matched" students in concurrent courses. In every case students in the intensive courses did as well as or better than students in concurrent courses.

These findings were corroborated by a more recent study conducted by Doyle and Sanders (11) at Central Michigan University. Preliminary findings indicate that in general there is no difference in achievement as measured by the final grade distributions between students enrolled in an introductory geography course taught under the following three conditions: (1) a three week intensive format, (2) a six week intensive format, and (3) a traditional semester format.

The literature on intensive scheduling has been characterized by a lack of experimental data. This is a potentially serious shortcoming, because case studies and ex post facto studies such as the ones referred to above, while they provide valuable information, are subject to serious pitfalls and criticisms pertaining to their validity (see 5). Principal among these pitfalls is the possibility of selection bias, i.e., different characteristics in the

experimental and the control groups. These different characteristics could be present and could have a differential effect on the achievement of the students in the experimental and the control groups even though the groups have been "matched."

To forestall this problem and the other threats to validity enumerated by Campbell and Stanley (5), an experiment was designed in which students who enrolled in an Institute graduate course in Industrial Psychology were randomly assigned to one of two treatments: a compressed schedule consisting of four weekends of nine hours of classes each, or a more extended format of nine weeks of classes with one four hour class per week. Students in each treatment used the same text, had the same instructor covering the same material, and had the same mid-term exam. On the mid-term exam, the students in the intensive group had a mean number of correct responses of 39.9, while those in the more protracted group had a mean score of 39.8. There was then essentially no difference between the two groups.

Studies such as this are critically important because they demonstrate that intensive scheduling is as effective as more traditional scheduling when the possibility of competing explanations, such as increased motivation on the part of the experimental group, are ruled out.

Retention

The evidence for the long-term retention of material learned in intensive courses is sparse. The same however is true of traditional courses. This is probably due to the relative difficulty of collecting followup data on students.

Powell (28), who has investigated the area of retention as it relates to intensive scheduling, concludes that:

> Although students and teachers believe that retention of material improves with concentrated studies, no one has ever done a serious comparative study under intensive and concurrent schedules. Thus, we don't know whether re-

tention is better or worse in intensive learning. This is a major research need. . . (P. 14).

An example of the type of study to which Powell refers is one conducted by Deveny and Brookout (8) in which they assert that students in intensive language courses who subsequently become majors are "invariably better prepared than their counterparts who go through the normal sequence" (p. 63).

Student Attitudes

Student attitudes toward the process of intensive scheduling, although not educational objectives in the same sense that cognitive and affective changes are, nonetheless, are critical bellwethers in the educational process. It is reasonable to assume that, if students enjoy what they are doing, are enthusiastic about it, and enjoy and relate well with those with whom they are working, the education which takes place will be more effective than if those characteristics are not present.

Students enrolled in intensive courses have reported that the rapport between students and instructors was superb, that student morale and effort were enhanced (8, p. 67), that closer personal relationships developed between faculty and students (and among students), and that intensive scheduling was apparently more conducive to friendly relations with the teachers (p. 109). Hefferlin (15) captures the essence of such findings when he reports that general student and faculty enthusiasm was a consequence of every experience to date with intensive scheduling (p. 96).

Faculty Attitudes

Faculty members who teach in the Institute are requested to fill out an End-of-Course Instructor Survey for each course they complete (9). Most of the 272 instructors who filled out the Survey indicated that they believed that the intensive schedule did not adversely affect their presentation of the course or

the students' ability to learn the subject matter; nor did they feel that the time schedule presented much difficulty for them in preparing for the course.

Sentiments like these are echoed throughout the literature. The studies reported above with respect to student satisfaction also report increased faculty enthusiasm and satisfaction (8, 15).

Problems with Intensive Scheduling

As in the case with any educational innovation, intensive scheduling is not without problems.

The following is a catalog of problems which have been identified in the literature with some regularity by faculty members as being associated with intensive scheduling and which would apply at the higher education level.

- oThe possibility of intense personality conflicts between student and instructor (28).
- oThe potential problems posed by the necessity for extensive advance organization on the part of the instructor (10).
- oThe consumption of "inordinate amounts" of physical and psychic energy for both students and teachers (2[illegible]).

At the Institute, students' opinions are solicited at the conclusion of each course. The most consistent comment made with respect to the intensive scheduling pattern is that far too much work is compressed into too short a time period, that the instructor attempted to cover too much material in too short a period of time, that the course should be divided into two semesters, etc.

These perceptions are misleading, however, because the same material is covered in compressed courses off-campus as is covered in extended courses on-campus which deal with the same subject matter; the grade distribution is roughly the same; and in many cases the instructor is the same. These

facts, in conjunction with the findings noted above, suggest strongly that the students are learning the same material as students in traditional courses although they are acutely sensitive to the processes of time in the intensive format.

Predictions

Strong inferences which can be made on the basis of the data presented above, enable one to predict with considerable confidence that:

(1) Students enrolled in intensive courses will perform in the cognitive domain at least as well as, and possibly better than, students who enroll in concurrent courses or extended courses.

(2) Intensive scheduling will not interfere with the faculty's ability to prepare for and present intensive courses nor with students' ability to learn the material.

(3) Although faculty and students who elect intensive courses will keenly perceive the time constraints imposed by this format, they will respond enthusiastically to such scheduling.

(4) Increased student-student and student-faculty rapport will develop between those who are enrolled in such courses.

PART III: DIRECTIONS FOR FURTHER STUDY

Although the state of the art enables us to make a number of confident predictions about the outcomes of intensively scheduled courses, a number of very suggestive areas remain open as profitable avenues for exploration. Among these are the following:

(1) Effectiveness of advance organizers: In the Institute, students are expected to arrive well prepared for their first meeting with the instructor.

Roughly two months before the beginning of the course, students receive copies of the course outline, the objectives, the textbook, a list of assigned readings, and written assignments to complete prior to the first class meeting. By the time they actually meet with their instructor, they are expected to be relatively knowledgeable in the subject matter area.

The question as to whether this is the most effective method of organizing and presenting pre-course instructional material is one which has not yet been definitively answered. Work in the area of advance organizers begun by Ausubel and summarized by Barnes and Clawson (1) is inconclusive but is certainly worthy of more intensive and extensive investigation. Barnes and Clawson do report that significant results based on the use of advance organizers have been obtained at the college undergraduate and graduate level.

(2) Warm up, slow down, and fatigue effects: In his summary of the findings on the relationship between time and learning, Bloom (2) alludes briefly to his observation that for some students at least there is a noticeable period of time at the beginning of class during which students are getting materials together, fixing clothes and hair, etc. Likewise there is a period of time toward the end of class during which educational activity slackens and preparations are made to leave. If it can reasonably be assumed that the amount of time spent warming up and winding down is constant, fewer classes, as in an intensive scheduling pattern, would mean less total time spent in such activity. Conversely, intensive courses would provide more total instructional time than shorter, more frequent, semester long courses.

(3) Motivation: It has been alleged that students who volunteer for intensive classes at the post secondary level are more highly motivated than those in concurrent or extended classes. It remains to be determined whether

this is actually so. In any event, motivation is probably not a reasonable explanation of that fact that students in intensive classes by and large do as well in the cognitive domain as students in traditional classes (10). Nonetheless, the question of motivation and its effects on students in novel educational settings is an interesting one and warrants further investigation.

(4) Subject matter for intensive courses: To date no data are available with respect to the type of subject matter most amenable to intensive scheduling. An analysis of the comments made by students on the End-of-Course Student Survey administered by the Institute indicates that students perceive more difficulty with the more quantitative courses such as statistics and accounting. The question, then, is whether or not this type of course is less well suited to intensive scheduling than "softer" courses such as group dynamics.

(5) Extent of Time Compression: It is often alleged that the more extensive the time compression, the less satisfactory the results of the course. This is still another question which should be investigated empirically. For example, is a course offered in two weekends better, the same as, or worse than one which is offered in five weekends in terms of cognitive outcome?

The psychological literature in the area of massed versus distributed practice has a direct bearing on this issue. Hefferlin (15) asserts that although the literature suggests that more learning and better retention take place under conditions of distributed learning, the results

> provide no evidence in either direction, for while intensive courses obviously represent more concentrated effort than concurrent ones, they do not constitute massed practice in the sense of most psychological experiments. Instead, they actually illustrate distributed practice since they employ daily cycles of rest and effort comparable to the 24-hour cycle sometimes and in distributed practice experiments. (p. 94)

An investigation of laboratory and field studies in the area of massed versus distributed practice corrborates Hefferlin's finding that the data are inconclusive with respect to intensive scheduling and the area is in need of further study (13, 18, 26, 31).

(6) Other modes of time compression: Several other avenues of exploration dealing with the general area of time compression are presently under exploration. Husen (19) has found for example that Swedish students isolated from school for half an academic year by severe weather were able to master as much material as students who attended school for the full academic year. Karweit (20) in her analysis of the relationship of the quantity of schooling and education achievement concludes that

> quantity of schooling is important...however...its effects should be investigated in a wide variety of school settings, with attention to individual student difference and to the possible importance of cumulative effects. (p. 67)

Findings such as these suggest that it may be possible to compress not only the total number of classes the student attends, but also the total number of hours which a student spends in class.

PART IV: SUMMARY

Intensive scheduling has been shown to be an effective educational medium; effective in the sense that desired cognitive and affective changes take place within this context. In addition, there are numerous other "fringe" benefits to intensive scheduling (see for example, 8).

Although it is clear from all the available evidence that intensive scheduling works at least as well as, and in some cases better than, traditional scheduling, the mechanisms responsible for the success of this approcah have not yet clearly been identified. Many aspects of intensive scheduling, some

of which have been enumerated above, warrant further investigation. Nonetheless, the facts strongly suggest that intensive education should play a clear and important role in a pluralistic educational system.

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